

This listing of claims will replace all prior versions, and listings, of the claims in this application:

Listing of Claims

Claim 1 (previously presented): A cascaded integrator comb digital filter, comprising:

- a cascaded integrator structure;
- a cascaded comb structure;
- a first rate change component, located between said cascaded integrator structure and said cascaded comb structure;
- a second rate change component, located with said cascaded comb structure; and
- a resonator component, located with said cascaded comb structure.

Claim 2 (original): The cascaded integrator comb digital filter according to Claim 1, wherein said first rate change component subsamples output received from said cascaded integrator structure and outputs a reduced rate signal to said cascaded comb structure.

Claim 3 (original): The cascaded integrator comb digital filter according to Claim 1, wherein said cascaded integrator structure comprises a plurality of integrator stages.

Claim 4 (original): The cascaded integrator comb digital filter according to Claim 1, further comprising a third rate change component.

Claim 5 (original): The cascaded integrator comb digital filter according to Claim 1, further comprising a plurality of additional rate change components.

Claim 6 (original): The cascaded integrator comb digital filter according to Claim 1, further comprising a signal generating component providing an oversampled signal as input to said cascaded integrator structure.

Claim 7 (original): The cascaded integrator comb digital filter according to Claim 6, wherein said signal generating component comprises a delta-sigma modulator.

Claim 8 (currently amended): The cascaded integrator comb digital filter according to Claim 1, wherein said cascaded integrator structure comprises a plurality of integrator stages and wherein said cascaded comb structure comprises [[a plurality of]] at least three comb stages, said plurality of integrator stages and said [[plurality of]] at least three comb stages having an equivalent number of stages.

Claim 9 (currently amended): The cascaded integrator comb digital filter according to Claim 8, wherein at least two comb stages of said [[plurality of]] at least three comb stages have different delay values.

Claim 10 (currently amended) The cascaded integrator comb digital filter according to Claim 1, wherein said cascaded comb structure comprises [[a plurality of]] at least three comb stages.

Claim 11 (currently amended): The cascaded integrator comb digital filter according to Claim 10, wherein said resonator component is located between two comb stages of said [[plurality of]] at least three comb stages.

Claim 12 (currently amended): The cascaded integrator comb digital filter according to Claim 10, further comprising a plurality of resonators located among said [[plurality of]] at least three comb stages.

Claim 13 (previously presented): A pre-decimated integrator filter section, comprising:

a data rate change component; and

a first integrator structure comprising at least one recursive integrator stage, said first integrator structure receiving data at a rate established by said data rate change component, said first integrator structure modifying data received from said data rate change component;

wherein the pre-decimated integrator filter section outputs data equivalent to data that would be output by a post-decimated integrator filter section having an equal number of integrator stages.

Claim 14 (original): The pre-decimated integrator filter section according to Claim 13, further comprising a second integrator structure having one or more integrator stages.

Claim 15 (previously presented): The pre-decimated integrator filter section according to Claim 13, wherein said first integrator structure comprises a recursive integrator stage and a plurality of multipliers.

Claim 16 (original): The pre-decimated integrator filter section according to Claim 13, wherein said data rate change component comprises a serial to parallel converter.

Claim 17 (original): The pre-decimated integrator filter section according to Claim 13, further comprising a read only memory device, said read only memory device being used by said first integrator structure to modify data received from said data rate change component.

Claim 18 (original): The pre-decimated integrator filter section according to Claim 13, wherein said first integrator structure modifies data received from

said data rate change component by applying coefficients stored in a look-up table.

Claim 19 (previously presented): The pre-decimated integrator filter section according to Claim 13, wherein said first integrator structure comprises a plurality of reduced rate parallel signal paths with a recursive integrator stage and a plurality of coefficient multipliers for each path.

Claim 20 (previously presented): A method of performing a pre-decimated cascaded integration in a filter section, comprising the steps of:

- changing the data rate of data being received by an integrator structure;
- performing a first integration procedure on data received at the changed data rate, wherein the first integration procedure includes at least one recursive integrator stage;

- executing a second integration procedure on data output by said first integration procedure, wherein the second integration procedure includes at least one additional recursive integrator stage; and

- outputting data equivalent to data that would be output by a post-decimated cascaded integrator having an equal number of integrator stages.

Claim 21 (previously presented): A method according to Claim 20, wherein said executing step comprises processing received data with a plurality of parallel recursive integrator stages.

Claim 22 (original): A method according to Claim 20, wherein said changing step comprises converting a received serial data stream to a parallel signal having a plurality of parallel paths and decimating the received data by a factor equal to the number of parallel paths.

Claim 23 (original): The method according to Claim 20, wherein said performing step further comprises modifying the received data by multiplication by determined coefficients.

Claim 24 (original): The method according to Claim 20, wherein said performing step comprises a step of accessing a memory device, data held by said memory device being used during said performing step to modify data received from said data rate change component.

Claim 25 (original): The method according to Claim 20, wherein said performing step includes a combining procedure further modifying data received at the changed data rate.

Claim 26 (previously presented): A tailored response cascaded integrator comb digital filter, comprising:

cascaded integrator means;

cascaded comb means;

first rate change means, located between said cascaded integrator means and said cascaded comb means;

second rate change means, located with said cascaded comb means; and
resonator means, located with said cascaded comb means.

Claim 27 (canceled)

Claim 28 (canceled)

Claim 29 (currently amended): The tailored response cascaded integrator comb digital filter according to Claim 26, wherein said cascaded comb means comprises [[a plurality of]] at least three comb stages.

Claim 30 (currently amended): The tailored response cascaded integrator comb digital filter according to Claim 29, wherein at least two comb stages of said [[plurality of]] at least three comb stages have different delay values.

Claim 31 (previously presented): A cascaded integrator comb digital filter, comprising:

a cascaded integrator structure;

a cascaded comb structure;

a first rate change component, located between said cascaded integrator structure and said cascaded comb structure;

a second rate change component, located with said cascaded comb structure; and

a third rate change component.

Claim 32 (previously presented): A cascaded integrator comb digital filter, comprising:

a cascaded integrator structure, comprising a plurality of integrator stages;

a cascaded comb structure, comprising a plurality of comb stages, at least two comb stages of said plurality of comb stages having different delay values;

a first rate change component, located between said cascaded integrator structure and said cascaded comb structure; and

a second rate change component, located with said cascaded comb structure;

wherein said plurality of integrator stages and said plurality of comb stages have an equivalent number of stages.

Claim 33 (canceled)

Claim 34 (previously presented): A tailored response cascaded integrator comb digital filter, comprising:

means for providing a cascaded integrator function;

means for providing a cascaded comb function;

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means for providing a first rate change, located between said means for providing a cascaded integrator function and said means for providing a cascaded comb function;

means for providing a second rate change, located with said means for providing a cascaded comb function; and

means for providing a resonator function, located with said means for providing a cascaded comb function.